

**IMPLEMENTING AGREEMENT  
BETWEEN THE UNITED STATES  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AND  
THE FEDERAL SPACE AGENCY,  
THE RUSSIAN FEDERATION,  
ON THE FLIGHT OF THE  
RUSSIAN LUNAR EXPLORATION NEUTRON DETECTOR (LEND)  
ON THE  
UNITED STATES LUNAR RECONNAISSANCE ORBITER (LRO)**

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## **PREAMBLE**

The United States National Aeronautics and Space Administration (hereinafter referred to as "NASA") and the Federal Space Agency of the Russian Federation (hereinafter referred to as "Roscosmos"), hereinafter referred to as the "Parties" collectively or "Party" individually,

Recognizing that the flight of the NASA Lunar Reconnaissance Orbiter (hereinafter referred to as "LRO") mission carrying the Russian Lunar Exploration Neutron Detector (hereinafter referred to as "LEND") will enhance the scientific return to the international science community in the areas of Moon exploration and Moon knowledge,

Noting that the LRO is a lunar satellite mission, the objective of which is to obtain data that will facilitate safe and sustainable lunar exploration,

Having decided to cooperate on the NASA LRO mission,

Have agreed as follows:

## **ARTICLE I: DESCRIPTION OF COOPERATION**

1. The cooperation set forth in this Implementing Agreement (hereinafter referred to as the "Agreement") shall be undertaken in accordance with the *Agreement Between the United States of America and the Russian Federation Concerning Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes*, of June 17, 1992 (hereinafter referred to as the "1992 Agreement"). This cooperation shall serve as a continuation of the joint activities associated with the study of the Moon carried out by Roscosmos in association with the Russian Space Research Institute (hereinafter referred to as "IKI") and NASA.
2. The scientific objectives of the Russian LEND determined in accordance with the Exploration Systems Mission Directorate-Robotic Exploration Program-0010 "LRO Mission Requirements" are:
  - a. Creation of high-resolution maps of hydrogen distribution with sensitivity of about 100 parts per million (ppm) of hydrogen at the lunar poles and horizontal spatial resolution of 5-20 kilometers (km).
  - b. Characterization of surface distribution and column density of possible near-surface water ice deposits in the Moon's polar cold traps.
  - c. Creation of a global model of the neutron component of space radiation at altitudes of 30-70 km above the Moon's surface with spatial resolution of 20-50 km within the spectral range from thermal energies up to 15 million electron volts (MeV).

## **ARTICLE II: RESPONSIBILITIES**

1. NASA shall use reasonable efforts to carry out the following:
  - a. Manage and operate the LRO mission.
  - b. Provide a flight opportunity on the LRO mission for the LEND.
  - c. Provide for the integration of the LEND into LRO.
  - d. Deliver to IKI interface electronic simulator and related support of the LRO for test and validation of the interface between LEND and LRO.
  - e. Define material and biological contamination constraints for lunar missions, consistent with the Committee on Space Research's (COSPAR) Planetary Protection Policy of October 20, 2002, as applicable, and ensure that the integrated payload meets planetary contamination constraints.
  - f. Provide for collection and transmission to Roscosmos of all of the mission scientific data from LEND.
  - g. Ensure mission operations support of LEND during the flight in accordance with the program of the mission.
  - h. Provide financial and management support for LEND Co-Investigators from the United States.
2. Roscosmos shall use reasonable efforts to carry out the following:
  - a. Deliver the LEND flight unit, one year prior to LRO launch which is currently scheduled for October 2008, to the Goddard Space Flight Center (GSFC), Greenbelt, Maryland, or to a NASA-designated contractor facility for integration and testing on the spacecraft. The entire list of hardware deliverables includes:
    - i. LEND electronics simulator.
    - ii. LEND engineering unit, if required by the LRO Project Office.
    - iii. LEND flight unit.
    - iv. LEND spare flight unit, if required by the LRO Project Office.
    - v. LEND ground support equipment.
    - vi. LEND mass simulator.

The deliverables ii, iii, and iv specified above shall contain <sup>10</sup>B (Boron) material. The deliverables shall also include all test data, instrument documentation including test procedures, analytical models, and certifications that the LEND meets the requirements

and specifications identified in the LRO Project Requirements and the standard requirements of Roscosmos for space scientific instrumentation.

- b. Provide qualified personnel to support mission operations and verification of LEND ground tests at GSFC, or a NASA-designated contractor facility.
- c. Provide to NASA any necessary planetary protection or planetary contamination information for accommodation of the LEND on the LRO.
- d. Provide the necessary operational support for mission operations and data processing of LEND during the performance tests and verification and during the flight.
- e. Provide scientific analysis to the NASA LRO project of the data provided by NASA from the LEND and publish the results of these scientific investigations.
- f. Provide the calibration data from LEND to the NASA LRO project.
- g. Provide to the NASA LRO project processed mission flight data from LEND as soon as technically feasible, but not to exceed one month from receipt of the raw data from NASA.

### **ARTICLE III: IMPLEMENTATION AND PROGRAM MANAGEMENT**

1. For the purposes of timely delivery, assembly, and successful operation of the LEND aboard the LRO spacecraft, the Roscosmos (and IKI) researchers shall carry out their technical activities in direct cooperation with NASA's GSFC, and as requested and agreed, GSFC contractors for the spacecraft.
2. The joint activity shall include the participation of a Russian Principal Investigator (PI) for LEND in the Project Science Group (PSG) of the LRO project. For scientific analysis of LEND data, a science team shall be led by the Russian PI, with participation of Russian and U.S. scientists, who were selected by NASA as Co-Investigators for the LEND investigation.
3. For NASA, the LRO Instrument Manager is responsible for the definition, integration, and assessment of all activities related to the LRO payload. The LRO Instrument Manager is also the principal point of contact for NASA in the performance of this Agreement.
4. For Roscosmos, the Lead of Department for Space Science is responsible for overall programmatic management of the Roscosmos-sponsored LRO contributions. The Lead of Department is the principal point of contact for Roscosmos in the performance of this Agreement.
5. For IKI, the LEND PI is responsible for overall programmatic and scientific management of the Russian-provided LEND. The LEND PI is the principal point of contact for IKI in the performance of this Agreement.

#### **ARTICLE IV: SCIENTIFIC DATA**

1. Science data obtained by the LRO mission investigators are to be released to the scientific community after a period of no longer than six months. The six-month period begins with the receipt by the PIs of usable science data, ground-based and flight calibration data, and any associated LRO data in a form suitable for analysis. At the end of this period, the scientific data shall become publicly available as specified in the following paragraph.
2. LRO mission investigators shall share data, interpretations, pre-publication manuscripts, and presentations with other investigators of the LRO mission, including Interdisciplinary Scientists and Participating Scientists in as close to real time as possible, to enhance the scientific return from the mission under procedures defined by the LRO PSG. Following the six-month period defined above, all scientific and ancillary LRO data records shall be submitted to NASA's Planetary Data System (PDS) in accordance with PDS standards and policies on suitable data levels.
3. Copies of all publications and reports detailing the scientific results of the LRO mission investigations shall be provided to the PDS. The PDS will, in turn, submit these publications and reports to NASA's National Space Science Data Center (NSSDC), where appropriate. Such publications and reports shall include a suitable acknowledgement of the services afforded by the contributions or the cooperation of each Party.
4. The Parties shall have the right to use the data, processed and unprocessed, at any time, for support of their respective responsibilities but shall not prejudice the mission investigators' first publication rights.
5. The Parties and their investigators shall have immediate access to scientific data obtained by their respective investigations.

#### **ARTICLE V: ORBIT, LAUNCH SCHEDULE, AND REGISTRATION**

The LRO launch is currently scheduled for October 2008 from the NASA Kennedy Space Center. NASA shall request that the Government of the United States register the LRO spacecraft as a space object in accordance with the 1975 Convention on Registration of Objects Launched into Outer Space (the Registration Convention). Exercise of jurisdiction and control over the spacecraft shall be subject to the relevant provisions of this Agreement. Registration pursuant to this paragraph shall not affect the rights or obligations of either Party or its Government under the 1972 Convention on International Liability for Damage Caused by Space Objects.

#### **ARTICLE VI: OWNERSHIP OF HARDWARE**

The hardware and instrumentation, owned and provided by each of the Parties, shall be used exclusively for purposes of carrying out this Agreement. All hardware and associated equipment, owned and provided by the Parties under this Agreement, shall remain the property

of the respective Party. All hardware and associated equipment of each Party, which was sent to the other Party during the development and implementation stage, should be returned to the owning Parties after the end of the mission, except the flight instrument integrated on LRO, unless otherwise agreed by the Parties.

## **ARTICLE VII: FUNDING**

The Parties shall each bear the costs of discharging their respective responsibilities, including travel and subsistence of personnel and transportation of all equipment and other items for which each is responsible. Consistent with Article III of the 1992 Agreement, the obligations of the Parties are subject to the availability of appropriated funds. Should either Party encounter budgetary problems, which may affect the activities to be carried out under this Agreement, the Party encountering the problems shall notify and consult with the other Party as soon as possible.

## **ARTICLE VIII: CUSTOMS AND IMMIGRATION**

1. Consistent with the *Agreement Between the Governments of the United States of America and the Russian Federation Concerning the Procedure for the Customs Documentation and Duty-Free Entry of Goods Transported Within the Framework of U.S.-Russian Cooperation in the Exploration and Use of Space for Peaceful Purposes* of December 16, 1994, the Parties shall identify goods and technical data that are eligible, pursuant to Article 3 of that Agreement, for the duty-free entrance to and exit from their respective countries. In the event that any customs duties, taxes, or charges of any kind are nonetheless levied on such equipment and related goods, such customs duties, taxes, or charges shall be borne by the Party of the country levying such customs duties, taxes, or charges. The Parties' obligation to facilitate duty-free and tax-free entry and exit of equipment and related goods is fully reciprocal.

2. Each Party shall facilitate provision of the appropriate entry and residence documentation for the other Party's representatives who enter, exit, or reside within its State's territory in order to carry out the activities under this Agreement.

## **ARTICLE IX: TRANSFER OF GOODS AND TECHNICAL DATA**

The Parties are obligated to transfer only those technical data (including software) and goods necessary to fulfill their respective responsibilities under this Agreement, in accordance with the following provisions, notwithstanding any other provision of this Agreement:

1. All activities of the Parties shall be carried out in accordance with their national laws and regulations, including those relating to export control and the control of classified information.

2. The transfer of technical data for the purpose of discharging the Parties' responsibilities with regard to interface, integration, and safety shall normally be made without restriction, except as provided in the preceding paragraph.

3. All transfers of goods and proprietary or export-controlled technical data are subject to the following provisions. In the event a Party or its related entity (e.g., contractor, subcontractor, grantee, cooperating entity) finds it necessary to transfer goods or to transfer proprietary or export-controlled technical data, for which protection is to be maintained, such goods shall be specifically identified and such proprietary or export-controlled technical data shall be marked. The identification for goods and the marking on proprietary or export-controlled technical data shall indicate that the goods and proprietary or export-controlled technical data shall be used by the receiving Party or related entities only for the purposes of fulfilling the receiving Party's or related entity's responsibilities under this Agreement, and that the identified goods and marked proprietary technical data or marked export-controlled technical data shall not be disclosed or retransferred to any other entity without the prior written permission of the furnishing Party or its related entity. The receiving Party or related entity shall abide by the terms of the notice and protect any such identified goods and marked proprietary technical data or marked export-controlled technical data from unauthorized use and disclosure. The Parties to this Agreement shall cause their related entities to be bound by the provisions of this Article related to use, disclosure, and retransfer of goods and marked technical data through contractual mechanisms or equivalent measures.

4. All goods exchanged in the performance of this Agreement shall be used by the receiving Party or related entity exclusively for the purposes of the Agreement. Upon completion of the activities under the Agreement, the receiving Party or related entity shall return or, at the request of the furnishing Party or its related entity, otherwise dispose of all goods and marked proprietary technical data or marked export-controlled technical data provided under this Agreement, as directed by the furnishing Party or related entity.

## **ARTICLE X: LIABILITY**

1. The Parties agree that a comprehensive cross-waiver of liability among the Parties and their related entities will enhance participation in space exploration, use, and investment. The cross-waiver of liability shall be broadly construed to achieve this objective. The terms of the waiver are set out below.

2. As used in this Article:

a. The term "Party" has the meaning specified in the Preamble;

b. The term "related entity" means:

- i. a contractor, subcontractor, or sponsored entity of a Party at any tier;
- ii. a user or customer of a Party at any tier;



- iii. a contractor or subcontractor of a user or customer or sponsored entity of a Party at any tier; or
- iv. scientific investigators.

The term "related entity" may also include another State or an agency or institution of another State, where such State, agency or institution is an entity as described in i through iv above or is otherwise involved in the activities undertaken pursuant to this Agreement.

The terms "contractors" and "subcontractors" include suppliers of any kind.

c. The term "damage" means:

- i. bodily injury to, or other impairment of health of, or death of, any person;
  - ii. damage to, loss of, or loss of use of any property;
  - iii. loss of revenue or profits; or
  - iv. other direct, indirect, or consequential damage.
- d. The term "launch vehicle" means an object or any part thereof intended for launch, launched from Earth, or returning to Earth which carries payloads or persons, or both;
- e. The term "payload" means all property to be flown or used on or in a launch vehicle; and
- f. The term "Protected Space Operations" means all activities pursuant to this Agreement, including launch vehicle activities and payload activities on Earth, in outer space, or in transit between Earth and outer space. Protected Space Operations begin at the entry into force of this Agreement and ends when all activities done in implementation of this Agreement are completed. It includes, but is not limited to:
- i. research, design, development, test, manufacture, assembly, integration, operation, or use of launch or transfer vehicles, payloads, or instruments, as well as related support equipment and facilities and services; and
  - ii. all activities related to ground support, test, training, simulation, or guidance and control equipment and related facilities or services.

The term Protected Space Operations excludes activities on Earth that are conducted on return from space to develop further a payload's product or process for use other than for the LRO mission.

3. a. Each Party agrees to a cross-waiver of liability pursuant to which each Party waives all claims against any of the entities or persons listed in subparagraphs i through iii below based on damage arising out of Protected Space Operations. This cross-waiver shall apply only if the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations. The cross-waiver shall apply to any claims for damage, whatever the legal basis for such claims, including, but not limited to, delict and tort (including negligence of every degree and kind) and contract, against:

- i. the other Party;
  - ii. a related entity of the other Party;
  - iii. the employees of any of the entities identified in subparagraphs i and ii immediately above.
- b. In addition, each Party shall extend the cross-waiver of liability as set forth in subparagraph X.3.a above to its own related entities by requiring them, by contract or otherwise, to agree to waive all claims against the entities or persons identified in subparagraphs X.3.a.i through X.3.a.iii above.
- c. Notwithstanding the other provisions of this Article, this cross-waiver of liability shall not be applicable to:
  - i. claims between a Party and its own related entity or between its own related entities;
  - ii. claims made by a natural person, his/her estate, survivors, or subrogees for bodily injury, other impairment of health or death of such natural person, except where the subrogee is a Party to this Agreement or has otherwise agreed to be bound by the terms of this cross-waiver;
  - iii. claims for damage caused by willful misconduct;
  - iv. intellectual property claims; or
  - v. claims for damage resulting from a failure of a Party to extend the cross-waiver of liability, as set forth in subparagraph X.3.b.
- d. Nothing in this Article shall be construed to create the basis for a claim or suit where none would otherwise exist.

## **ARTICLE XI: INTELLECTUAL PROPERTY**

1. Pursuant to Article VI of the 1992 Agreement, the Parties find it necessary and appropriate to provide protection for patent and invention rights in accordance with the terms as set forth below.
2. For the purposes of this Article, "related entity" includes, but is not limited to, contractors, subcontractors, grantees, or cooperating entities (or any lower-tier contractor, subcontractor, grantee, or cooperating entities) of a Party.
3. Patents
  - a. Nothing in this Agreement shall be construed as granting, either expressly or by implication, to the other Party any rights to, or interest in, any inventions of a Party or its related entities made prior to the entry into force of, or outside the scope of, this Agreement, including any patents or other forms of protection (in any country) corresponding to such inventions.
  - b. Any rights to, or interest in, any invention made in the performance of this Agreement solely by one Party or any of its related entities, including any patents or other forms of

protection (in any country) corresponding to such invention, shall be owned by such Party or, subject to paragraph 3.d of this Article, such related entity.

c. It is not anticipated that there will be any joint inventions made in the performance of this Agreement. Nevertheless, in the event that an invention is jointly made by the Parties in the performance of this Agreement, the Parties shall, in good faith, consult and agree as to: a) the allocation of rights to, or interest in, such joint invention, including any patents or other forms of protection (in any country) corresponding to such joint invention; b) the responsibilities, costs, and actions to be taken to establish and maintain patents or other forms of protection (in any country) for each such joint invention; and c) the terms and conditions of any license or other rights to be exchanged between the Parties or granted by one Party to the other Party.

d. With respect to any invention created in the performance of this Agreement and involving a related entity, allocation of rights between a Party and its related entity to such invention, including any patents or other forms of protection (in any country) corresponding to such invention, shall be determined by such Party's laws, regulations, and applicable contractual obligations.

#### **4. Copyrights**

a. Nothing in this Agreement shall be construed as granting, either expressly or by implication, to the other Party any rights to, or interest in, any copyrights of a Party or its related entities created prior to the entry into force of, or outside the scope of, this Agreement.

b. Any copyrights in works created solely by one Party or any of its related entities, as a result of activities undertaken in performance of this Agreement, shall be owned by such Party or related entity. Allocation of rights between such Party and its related entities to such copyrights shall be determined by such Party's laws, regulations, and applicable contractual obligations.

c. For any jointly authored work, should the Parties decide to register the copyright in such work, they shall, in good faith, consult and agree as to the responsibilities, costs, and actions to be taken to register copyrights and maintain copyright protection (in any country).

d. Subject to the provisions of Articles XII (Publication of Public Information and Results) and IX (Transfer of Goods and Technical Data), each Party shall have an irrevocable, royalty-free right to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, and authorize others to do so on its behalf, any copyrighted work resulting from activities undertaken in the performance of this Agreement for its own purposes, regardless of whether the work was created solely by, or on behalf of, the other Party or jointly with the other Party, and without consulting with or accounting to the other Party.

### **ARTICLE XII: PUBLICATION OF PUBLIC INFORMATION AND RESULTS**

1. The Parties retain the right to release public information regarding their own activities under this Agreement. The Parties shall coordinate with each other in advance concerning releasing to the public information that relates to the other Party's responsibilities or performance under this Agreement.

2. a. The Parties shall make the final results obtained from the LEND instrument available to the general scientific community through publication in appropriate journals or by presentations at scientific conferences as soon as possible and in a manner consistent with good scientific practices.

b. Each Party shall have an irrevocable, royalty-free right to reproduce, prepare derivative works from, distribute to the public copies of, present publicly, and authorize others to do so on its behalf, the scientific information included in each such publication or presentation for its own purposes. The royalty-free right shall exist irrespective of any copyright protection applicable to each such publication or presentation.

3. The Parties acknowledge that the following data or information does not constitute public information and that such data or information shall not be included in any publication or presentation by a Party under this Article without the other Party's prior written permission: 1) data furnished by the other Party in accordance with Article IX (Transfer of Goods and Technical Data) of this Agreement which is export-controlled, classified, or proprietary; or 2) information about an invention of the other Party before a patent application has been filed covering the same, or a decision not to file has been made.

### **ARTICLE XIII: DISPUTE RESOLUTION**

1. The Parties shall consult promptly with each other on all issues involving interpretation and implementation of this Agreement.

2. In the event a dispute arises, such matters shall first be referred to the individuals identified in Article III.

3. Any matter that has not been settled in accordance with the above paragraph shall be referred to the NASA Associate Administrator for Exploration Systems Mission Directorate and the Roscosmos Deputy Head, or their designees, for resolution.

### **ARTICLE XIV: MISHAP INVESTIGATIONS**

In the case of a mishap or mission failure, the Parties agree to provide assistance to each other in the conduct of any investigation, bearing in mind the provisions of Article IX. In the case of activities which might result in the death of, or serious injury to persons, or substantial loss of, or damage to property as a result of activities under this Agreement, the Parties agree to establish a process for investigating each such mishap as part of their program/project implementation plan.

### **ARTICLE XV: DURATION**

1. This Agreement shall remain in force until December 31, 2011. This Agreement may be amended or extended at any time by written mutual agreement of the Parties.

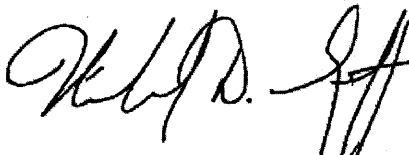
2. Either Party may terminate this Agreement upon at least six months written notice to the other Party.

3. Termination of this Agreement shall not affect the Parties' continuing obligations under Articles IV: Scientific Data; VI: Ownership of Hardware; VIII: Customs and Immigration; IX: Transfer of Goods and Technical Data; X: Liability; XI: Intellectual Property; and XII: Publication of Public Information and Results unless otherwise agreed by the Parties.

#### ARTICLE XVI: ENTRY INTO FORCE

This Agreement shall enter into force upon signature by the Parties and an exchange of diplomatic notes extending the 1992 Agreement.

The undersigned, being duly authorized, have signed this Agreement, in duplicate, in the English and Russian languages, each text being equally authentic.



FOR THE UNITED STATES  
NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION

Date: 3/10, 2007

At: Moscow



FOR THE FEDERAL SPACE AGENCY,  
THE RUSSIAN FEDERATION

Date: 03.10, 2007

At: г. МОСКВА